June 2016
Highlights from the Dale Bumpers National Rice Research Center
Stuttgart, AR

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1. Recently Accepted Publications

ARS Anticipated Product: Introgression of genes from progenitor species into adapted genepools to produce higher yielding plants.

Eizenga, G.C., Edwards, J.D., Yeater, K.M., McCouch, S.R., and McClung, A.M. 2016. Transgressive variation for yield components measured throughout the growth cycle of Jefferson rice (*Oryza sativa*) × *O. rufipogon* introgression lines. Crop Science 56:1–12. DOI: 10.2135/cropsci2015.10.0603

Cultivated rice (*Oryza sativa*) is a major food crop for much of the world's population, thus increasing yield is a major objective for rice breeding programs. One way to increase yield is to increase diversity in rice by introducing the genes lost during the domestication process. An international study revealed the wild ancestral species, *O. rufipogon*, increased rice yields in selected progeny derived from hybridization with five diverse rice cultivars from around the world. To better understand these yield increases observed under field conditions, a set of breeding lines developed using *O. rufipogon* crossed with the southern U.S. long grain cultivar, Jefferson, were evaluated in a controlled greenhouse study to identify differences in plant development and traits associated with yield. Traits contributed from the *O. rufipogon* parent that were associated with increased yield were a longer growing cycle, longer panicles, increased number of seeds on the panicle and better seed set. These results validated previous field trial findings as well as identified new growth parameters that have significant influence on yield. The fact that these yield-enhancing traits can be selected in the greenhouse will expedite the breeding process and increase interest in using a wider diversity of parents for breeding.

2. New Significant Research Collaborations

International

A three year award of $150k from Office of International Research Program (OIRP) was received as part of Cooperative Research Project between the USDA-ARS-DBNRRC and Rural Development Association, National Institute of Crop Science- Crop Breeding Research Division of the Republic of Korea. The title of the project "Exploring rice genetic resources for use in adapting to climate change and mitigating greenhouse gas emissions". The funds will be used for field and greenhouse evaluation of methane emissions in rice. Drs. Jinyoung Barnaby, Anna McClung, and Lewis Ziska (Beltsville) are the ARS scientists involved in the project

Dr. Danting Li, a professor of Rice Breeding and Genetics at the Rice Research Institute, Guangxi Academy of Agricultural Sciences in Nanning, China arrived on June 28, 2016. She will be conducting collaborative research with Dr. Georgia Eizenga over the next year, to identify new sources of genetic resistance to rice sheath blight which is a major disease of rice in the USA and in China.

USA

3. New Awarded Grants

4. Technology Transfer

a. Formal Events:

To Non-research stakeholders

To Research Community

b. Informal Contacts:

June 13, Dr. Shannon Pinson provided information to two scientists with the University of Arkansas, Fayetteville, AR on quarantine methods and permits for importing plant tissues for destructive laboratory analysis.

c. New MTAs

d. Germplasm Exchanged:

During June, 221 rice accessions from the Genetics Stocks *Oryza* (GSOR) collection were distributed to researchers in the US.

5. Educational Outreach

During the week of June 6-10, 2016, the Dale Bumpers National Rice Research Center (DBNRRC) in Stuttgart, AR partnered with Dr. Venkatesan Sundaresan at University of California, Davis to host undergraduate interns from University of Arkansas, Pine Bluff (1890's University) as part of a National Science Foundation funded project entitled "Genomics Of Host-Microbiome Interactions In Rice". The students met with a wide variety of researchers at DBNRRC and University of Arkansas throughout the week to learn of research being conducted to address issues important to the rice industry.

On June 21, 18 students from the Stuttgart, AR school district visited the Dale Bumpers National Rice Research Center as part of the Gear-Up summer educational program. GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Programs) is a grant funded by the US Department of Education. The program is designed to increase the number of low-income students who are prepared to enter and succeed in postsecondary education. The students participated in hands-on activities including performing DNA extractions, learning how to decipher the DNA code, conducting chemical analysis of rice starch content, and comparing flavor and texture of different cooked rice varieties.

On June 28th the Dale Bumpers National Rice Research Center hosted 35 board members of the Mississippi Farm Bureau and organization that represents over 192,000 farmer family members. The group was conducting a tour through Arkansas to learn about agriculture and research conducted in the state. The group listened to presentations on research conducted at the center, participated in tasting five cooked rice varieties that differed in flavor, texture and appearance, and toured field research plots where genetic and weed physiology studies are being conducted.

On June 29th, Dr. Anna McClung, was invited to meet with some 30 educators in the state as part of an event hosted by Economics Arkansas in Stuttgart, AR. Economics Arkansas is a private, non-profit, non-partisan, educational organization founded in 1962 to promote economic literacy in Arkansas.The purpose of the meeting was to allow educators and representatives of industry to discuss education and skills needed in the workforce. Dr. McClung presented an overview of research at the center and opportunities for employment with USDA-ARS.

6. Awards/Honors